DOCUMENT RESUME

ED 163 015 TM 006 675

AUTHOR	Wilson, Kenneth M.
TITLE	The Contribution of Measures of Aptitude (SAT) and Achievement (CEEB Achievement Average), Respectively, in Forecasting College Grades in Several Liberal Arts Colleges.
INSTITUTION	Educational Testing Service, Princeton, N.J.
REPORT NO	ETS-RB-74-36
PUB DATE	Aug 74
NOTE	25p.
EDRS PRICE	MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS	*Achievement Tests; Aptitude Tests; *College Entrance Examinations; *College Freshmen; Females; Grade Point Average; *Grade Prediction; Higher Education; *Predictive Validity; Predictor Variables; Suppressor Variables; *Test Validity
IDENTIFIERS	*Scholastic Aptitude Test

ABSTRACT

This paper presents evidence bearing on the predictive validity of the College Board (CEEB) Achievement Average--defined as the arithmetic mean of all Achievement Test scores included on a candidate's CEEB Admissions Testing Program score report and now routinely reported to colleges--for women students in several liberal arts colleges. The findings reviewed are consistent with those reported earlier by Schrader that the CEEB Achievement Tests contributed modestly to improvement of predictive effectiveness over that provided by the Scholastic Aptitude Test (SAT) and the high school record. In the studies reviewed, there was a tendency for the SAT scores (particularly the SAT-Mathematics score) to operate, in effect, as suppressor variables when included in a battery with the CEEB Achievement Average. It would appear not only that the CEEB Achievement Average tends to be a more valid predictor of college grades than the SAT in the settings studied, but also that this composite contains all the SAT-type information that is useful for such prediction--i.e., that the SAT scores become redundant after taking into account information provided by the CEEB Achievement Average, with its substantial SAT-type components. Questions are raised regarding the extent to which candidate freedom of choice in test selection is a factor which contributes to the predictive effectiveness of the CEEB Achievement Average. (Author/CTM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED163015

RESEARCH BULLETIN

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

RB-74-36

THE CONTRIBUTION OF MEASURES OF APTITUDE (SAT) AND ACHIEVEMENT (CEEB ACHIEVEMENT AVERAGE), RESPECTIVELY, IN FORECASTING COLLEGE GRADES IN SEVERAL LIBERAL ARTS COLLEGES

Kenneth M. Wilson

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Kenneth Wilson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

TM006 675

This Bulletin is a draft for interoffice circulation. Corrections and suggestions for revision are solicited. The Bulletin should not be cited as a reference without the specific permission of the author. It is automatically superseded upon formal publication of the material.

Educational Testing Service
Princeton, New Jersey
August 1974

The Contribution of Measures of Aptitude (SAT) and Achievement (CEEB Achievement Average), Respectively, in Forecasting College Grades in Several Liberal Arts Colleges

Kenneth M. Wilson

Educational Testing Service

Abstract

The validity of the CEEB Scholastic Aptitude Test-Verbal and SAT-Mathematical scores, separately and in combination with the high school record (rank in class or high school average grade) for predicting college grade averages, has been widely studied and reported, but the value of CEEB Achievement Tests for such prediction has not been subjected to comparable scrutiny. Consequently it is not widely recognized that a composite (sum or average) of scores, based on whatever combination of Achievement Tests a candidate takes, can be useful for assessing the general academic-performance potential of candidates.

This paper presents evidence bearing on the predictive validity of the CEEB Achievement Average--defined as the arithmetic mean of all Achievement Test scores included on a candidate's CEEB Admissions Testing Program score-report and now routinely reported to colleges--for women students in several liberal arts colleges.

The findings reviewed are consistent with those reported earlier by Schrader that the CEEB Achievement Tests contributed modestly to improvement of predictive effectiveness over that provided by the SATs and the school record. In the studies reviewed, there was a tendency for the

SAT scores (particularly the SAT-M score) to operate, in effect, as suppressor variables when included in a battery with the CEEB Achievement Average. It would appear not only that the CEEB Achievement Average tends to be a more valid predictor of college grades than the SAT in the settings studied, but also that this composite contains all the SAT-type information that is useful for such prediction--i.e., that the SAT scores become redundant after taking into account information provided by the CEEB Achievement Average, with its substantial SAT-type components.

Questions are raised regarding the extent to which candidate freedom of choice in test selection is a factor which contributes to the predictive effectiveness of the CEEB Achievement Average.

The Contribution of Measures of Aptitude (SAT) and Achievement (CEEB Achievement Average), Respectively, in Forecasting College Grades in Several Liberal Arts Colleges

Kenneth M. Wilson

Educational Testing Service

Many colleges regularly require applicants for admission to present scores on the College Entrance Examination Board's (CEEB) Scholastic Aptitude Test (SAT) in order to obtain information about a candidate's facility in verbal and mathematical reasoning without regard to the particular pattern of subjects studied in school. Some colleges, particularly the more selective ones, also require applicants to present scores on CEEB Achievement Tests--tests of achievement in specific high school subject-fields--to supplement information provided by the SAT and the high school record.[1] Candidates typically have some freedom of choice in the selection of tests and all candidates do not present the same combination of CEEB Achievement Tests.

The validity of SAT-Verbal (SAT-V) and SAT-Mathematical (SAT-M) scores, separately and in combination with the high school record (rank-in-class or high-school average-grade), for predicting college grade-averages has been widely studied and reported. However, the value of CEEB Achievement Tests for such prediction has not been subjected to comparable scrutiny. Comparatively few studies of the predictive validity of these tests have been made, and for this state of affairs

---

[1] For an overview of the Achievement Tests, and considerations relating to their development and use, see Chapter III, by Coffman (1971), in a comprehensive report on research and development activities relating to the CEEB Admissions Testing Program, edited by Angoff (1971).

Schrader (1971) has suggested two principal reasons:

a) the argument that content validity, not predictive validity, is decisive for achievement tests has militated against reliance on correlations with college grades as a basis for validation;

b) the fact that all individuals do not present scores on the same set of Achievement Tests has complicated validation of the tests against general grade-average criteria; " . . .using the average score on whatever set of tests a candidate presents may well be less appealing [to test users] than using the scores subjectively to form a judgment of the candidate's preparation, even though the scaling of the scores [which takes into account differences in the level of verbal ability (SAT-V scores) of candidates taking the respective tests] makes the scores on different tests as comparable as possible." (p. 135)

Consequently, it is not widely recognized that a composite (sum or average) of scores, based on whatever combination of Achievement Tests a candidate takes, can be useful for assessing the general academic-performance potential of candidates--i.e., prediction batteries including an "achievement average" may yield higher multiple correlations with college grades than batteries including only the high school record and the SAT.[2]

In a review of largely unpublished data from studies conducted by the CEEB Validity Study Service and in connection with CEEB summer

---

[2]The value of such a composite for predicting freshman standing at Harvard was reported almost 30 years ago by Dyer (1946).

admissions institutes, Schrader (1971) reported that adding an "achievement average" to the school record and the SAT yielded median gain in multiple correlation (corrected for shrinkage) of .05 for women (over 40 samples and .03 for men (over 25 samples), in liberal arts and general programs. Similar findings obtained for more limited data on students in other types of curricula as well. The probability that the scores would be more useful in some colleges than in others was suggested, and Schrader cautioned that the findings reviewed reflected the contribution of Achievement Test scores when they " . . .are treated according to the formal procedure used in these studies."

In the studies involved, if there was a specifically required Achievement Test (i.e., one which all applicants to a given college were required to take), that test was treated as a separate predictor and the average of the remaining Achievement Tests was then introduced. Only cases with at least two Achievement Tests were included in the analyses. Data were reported regarding the predictive value (a) of the high school record alone, (b) of the high school record combined with SAT-V and SAT-M, and (c) of the high school record, SAT-V, SAT-M and the Achievement Test scores treated as described above. The order of introduction of predictors was termed "realistic in that Achievement Tests are almost always used along with the SAT in prediction of college success, while many colleges use the SAT without the Achievement Tests." (p. 135).

The studies reviewed by Schrader provide clear evidence that adding CEEB Achievement Tests, "averaged" in a particular way, to a battery

containing the high school record and the SAT scores, can improve prediction of general college-grade-average criteria--i.e., that an "achievement average" contains information about a candidate's academic potential that is not reflected in the school record and/or the aptitude test. Only one of several possible procedures for summarizing scores on the various Achievement Tests presented by a candidate was explored in these studies. Since 1970-71, for example, the CEEB Admissions Testing Program (ATP) has reported to colleges an "Achievement Average" defined as the arithmetic mean of all Achievement Test scores on the candidate's score report, including scores from repeated tests. Moreover, questions regarding the contribution of the respective predictors were not directly considered.

It is the purpose of this paper (a) to summarize additional evidence bearing on the predictive validity of the CEEB Achievement Average, constructed according to the CEEB/ATP definition, for women students in several liberal arts colleges and (b) to examine the contribution of measures of aptitude (SAT), the high school record (rank), and the CEEB Achievement Average, respectively, to forecasts of college grades. The evidence presented tends to confirm and extend the findings reviewed by Schrader regarding the potential value of a CEEB Achievement-Test composite for improving forecasts of college grades.

The Data

For a number of years, several liberal arts colleges have used an admissions battery comprised of the CEEB Achievement Average (mean of all

Achievement Tests reported, including repeated tests), SAT-Verbal, SAT-Mathematical, and secondary school rank-in-class (Rank) converted to a standard distribution with a mean of 50 and a standard deviation of 10.[3] These colleges have participated periodically in validity studies. In every case the criterion was Freshman Average Grade (FAG). The findings surveyed in this report are from studies for the Classes of 1968, 1969, 1970, and 1972 respectively. Studies were based on all cases with complete data, typically essentially all entering students, and N's ranged between approximately 100 and 500. Multiple correlation and regression analyses were performed.

Questions guiding analysis and summarization of the data from these studies were as follows:

1) Does the CEEB Achievement Average (Ach Av) contribute to prediction of FAG after taking into account Converted School Rank (Rank), SAT-V, and SAT-M?

2) Does the SAT contribute to prediction of FAG after taking into account Rank and Achievement Average?

3) To what extent and in what way does each admissions variable contribute to prediction of FAG? What is the contribution of the aptitude and achievement measures, respectively?

---

[3]The colleges involved are as follows: Briarcliff (NY), Hollins, Randolph-Macon Woman's, Trinity (DC), Vassar, Connecticut, Mount Holyoke, and Wheaton College. These colleges have participated from time to time in studies conducted by College Research Center (CRC), an agency for inter-institutional cooperation in institutional research, affiliated formally with ETS during the period 1970-71 through 1973-74, and currently informally associated with ETS. The first five colleges comprise the 1974-75 membership of CRC. Colleges are identified throughout this report by a letter code.

Findings

The data in Table 1, based on analyses for the Class of 1970, are related to the first question, above. For each of eight colleges,

---

Insert Table 1 about here

---

multiple correlation coefficients are shown for Freshman Average Grade versus (a) SAT-V and SAT-M, (b) SAT-V, SAT-M, and Rank, and (c) SAT-V, SAT-M, Rank, and Achievement Average.

Adding Rank to SAT resulted in gains in multiple correlation ranging between approximately .06 (College J) and .20 (College D). In six of the eight colleges, further gains resulted when the Achievement Average was added; gains ranged from approximately .05 (College G) to .14 (College F). For Colleges B and J, the Achievement Average does not appear to contribute to prediction after SAT and Rank have been taken into account.

Shown in Table 2 are data, largely for the Class of 1972, indicating what results when the sequence of predictors is changed. When Rank and

---

Insert Table 2 about here

Ach Av are introduced first, the question then becomes "Does the SAT contribute to prediction of FAG after taking into account the information provided by the two measures of school achievement?" Data were analyzed for students of public and private school origin, respectively.

The first column of multiple correlation coefficients in Table 2 reflects the relationship between FAG and the best-weighted combination of Rank and Ach Av, only, while the second column of coefficients indicates the effect of adding SAT-V and SAT-M to the first two predictors. In all comparisons, the increase in correlation due to adding the measures of verbal and mathematical aptitude scores was relatively slight--median "gain" due to adding SAT scores was .007.

The data in Table 1 suggest that starting with predictions based on the SAT, (a) accuracy of prediction can be improved by taking Class Rank into account and (b) in most instances, scores on the CEEB Achievement Tests (averaged) add information not supplied by either the SAT or Rank. The data in Table 1 also indicate that both SAT and Rank provide information which is useful for prediction when they are considered separately or in combination. On the other hand, however, the data in Table 2 indicate that starting with predictions based on Rank and Ach Av, adding the SAT scores does not tend to improve predictions very much, if at all, in most instances. In essence, it appears that Ach Av can provide information about an individual's performance-potential that is not provided by Rank and/or SAT scores (consistent with findings reviewed by Schrader), but that the predictive information contained in the SAT may be redundant once the information provided by Rank and Ach Av has been taken into account.

Weighting of the Predictors

In the circumstances, it is important to consider how much and in what way each of the preadmissions measures contributes to prediction of

FAG. Each of the variables is related to some extent to FAG but they are also related to each other--i.e., they reflect to some extent the operation of similar abilities, traits, etc.

Shown in Table 3 are standard score regression weights (beta weights)

Insert Table 3 about here

---

from multiple correlational analyses in several classes. These weights are applicable to the respective admissions scores (a) when they are expressed in comparable, standard-deviation score units, and (b) when their interrelationships have been taken into account. A total of 44 samples, 22 public and 22 private, is represented.

Certain features of the data in Table 3 are noteworthy:

1) As expected from findings reviewed in Tables 1 and 2, beta weights for Rank and Ach Av, tend to be greater than the weights for SAT-V and SAT-M;

2) In all instances, weights for Rank and Ach Av are positive, but in a majority of the samples (28 of 44) the beta weight for SAT-M is negative, and negative weighting is associated with SAT-V in a lesser number of instances (11 of 44). In such cases, the best-weighted composite for purposes of predicting freshman grades involves subtraction of the designated proportion of SAT-M and/or SAT-V score(s).

The first observation simply reflects what already could be inferred from Tables 1 and 2, namely, that in the several colleges involved,

measures of school performance (Rank and Ach Av) characteristically tend to contribute more to prediction of grades than the SAT. The recurrence of negative weights for SAT-M (and occasionally SAT-V) in these analyses, however, calls for further examination, especially in view of the fact that simple correlation with FAG of SAT-V and SAT-M, respectively, are positive, albeit "low," in most instances (see Table 4).

Insert Table 4 about here

Negative weights for SAT. An independent or predictor variable is negatively weighted in a regression equation if it is inversely (negatively) related to a dependent or criterion variable. However, under certain circumstances a predictor may be negatively weighted in a battery even though its relationship to the dependent variable is zero or positive, namely, when such a predictor correlates well with another predictor which shows a higher correlation with the criterion. In such cases the predictor in question takes a negative weight in the prediction formula, indicating that by its use in conjunction with the more valid predictor some of the variance in the more valid predictor is being suppressed (McNemar, 1949; Thorndike, 1949).

There have been few comprehensive appraisals of the suppression effect, " . . . an interesting paradox of multiple correlation . . ." (McNemar, 1949, p. 163), partly because it is rarely observed--or seldom reported because the overall contribution to prediction typically is slight and the effect resistant to replication--and partly because it is

interpreted more readily in statistical than in psychological terms, hence is difficult to rationalize.

Most of the negative weights in Table 3--those marked by a single asterisk--represent samples in which the simple correlation between FAG and the SAT score(s) was positive, hence were samples in which an SAT score, typically the SAT-M score, was operating in effect as a suppressor. In only a few instances--largely explainable in terms of sampling variation and marked by a double asterisk--does the negative beta weight represent a sample in which a negative correlation obtained between FAG and one or both of the SAT scores. In Table 4, which summarizes simple correlation coefficients for the Classes of 1968, 1969, 1970, and 1972, respectively, the coefficients marked by a single asterisk identify sample findings corresponding to similarly designated entries in Table 3, i.e., identify situations in which the SAT score in question has a positive correlation with FAG but is negatively weighted in the battery.

The prevalence of negative betas for SAT-M, and occasionally SAT-V, suggests that the operation of one or both SAT scores as suppressor variables is a recurring phenomenon in the colleges involved. At College J for which no suppression effect appeared in the analyses reported in the tables, SAT-M was found to take on a negative weight in an earlier sample.

As for the several negative zero-order coefficients for SAT-M versus FAG, given their small magnitude and the lack of any persuasive support for the notion that mathematical aptitude and college grades should be inversely related, they may be attributed to chance fluctuations

around a population figure which approaches zero--even at College C, where the correlation between grades and SAT-M scores was found to be negative but slight (averaging -.04) in four successive analyses for students of private-school origin.

Having identified the independent variable which acts, in effect, as a suppressor variable, it is important to identify the independent variable from which something is being taken out or suppressed. What variable in the standard battery is (a) a better predictor of freshman grades than that which is acting as a suppressor and (b) also relatively closely related to that variable? This variable turns out to be the CEEB Achievement Average.

The patterns of interrelationships characteristic of the data are suggested by the following set of intercorrelations, median coefficients from public and private school samples in seven colleges, for the Class of 1968:

Intercorrelation Matrix

Variables	SAT-Verbal Pub	SAT-Verbal Pvt	SAT-Math Pub	SAT-Math Pvt	Ach Av Pub	Ach Av Pvt	FAG Pub	FAG Pvt
School Rank	.06	.00	.22	.14	.18	.08	.53	.41
SAT-Verbal	----		.22	.16	.43	.42	.16	.20
SAT-Mathematical			----		.39	/.47/	.21	/.12/
Achievement Average					----		.32	/.31/

SAT scores relate more closely to the Ach Av than to either Rank or FAG, and Ach Av is a more valid predictor of FAG than either SAT-V or

SAT-M. In this particular set of data a suppression effect would be found to obtain for SAT-M in the data for private school graduates (Pvt): SAT-M correlates .12 with FAG and .47 with Ach Av, which in turn correlates .31 with FAG.

In the circumstances, it may be argued that some of the variation in the CEEB Achievement Average, namely, that representing covariation with SAT-Mathematical ability, is "irrelevant" (SAT-M correlates only .12 with FAG) hence must tend to lower the correlation between the Achievement Average and FAG. Accordingly, elimination of some of the SAT-related variance in the Achievement Average should result in increased correlation of the composite with Freshman Average Grade--i.e., the Achievement Average minus some portion of the SAT-M score should correlate more highly with grades than Achievement Average alone. Put in other terms, the correlation between Freshman Average Grade and Achievement Average should be increased somewhat when an appropriate portion of the non-grade-related variance which it shares with SAT-M is "eliminated" or "suppressed" by subtracting an appropriate portion of the SAT-M score. And this is true occasionally for SAT-V as well.

Discussion

The findings reviewed here are consistent with those reported by Schrader, and they tend to confirm and extend his conclusion that the CEEB Achievement Tests " . . .make a modest contribution to predictive effectiveness over and above that provided by the high school record and the SAT." Equally important, they indicate that in the settings

studied, information provided by the SAT scores adds little of value for predicting college grades after taking into account the high school record and the CEEB Achievement Average.

Moreover, in a majority of samples, SAT-M (and occasionally SAT-V as well) serves primarily to "refine" the CEEB Achievement Average, a more valid predictor of college grades, so that even the typically slight additional contribution of the SAT scores to prediction frequently is indirect--through suppression--rather than direct. In essence, for the colleges involved in these studies, it would appear not only that the CEEB Achievement Average is a more valid predictor of performance than the SAT, but also that it contains all the SAT-type information that is useful for predicting freshman grades.

From the point of view of predictive efficiency, the findings suggest that these colleges' operational prediction formulae should be based solely on the Achievement Average and Rank. Even if the weighting of the SAT scores were more substantial, questions would arise regarding the inclusion of suppressor variables in operational prediction formulae. Thorndike (1949), for example, has argued the advisability of eliminating suppressors from a prediction battery when there is no satisfactory psychological rationale for the suppression effect. The propriety, in college-admissions contexts, of " . . . allowing a poor performance on any predictor to increase a candidate's predicted grade" has been questioned by Schrader (1971, p. 121) who recommends recomputation of the prediction formulae without the negatively weighted variable.

Is the type of interaction observed in these data primarily a function of contextual factors (e.g., degree of selectivity of the institutions, differential selection on various elements in the admissions battery, sex of the students involved, curricular emphases of the colleges) or does it have more general import (e.g., for the question of "aptitude" versus "achievement" testing for purposes of assessing the general academic promise of college students)?

To answer such a question, evidence will be required from a wide range of settings as to the interaction of the Achievement Average and SAT when both are included in predictive batteries with the high school record. The consistency with which the CEEB Achievement Tests (averaged in various ways) have been found to contribute usefully to prediction of college performance suggests that every college whose applicants present both Achievement Test and SAT scores should seek empirical evidence regarding the predictive validity of the achievement and aptitude measures, individually and in combination with the high school record. The fact that the CEEB Achievement Average employed in these studies is now being reported routinely by the CEEB Admissions Testing Program, along with an individual's SAT scores and scores on the individual Achievement tests involved, should facilitate and encourage efforts to obtain evidence regarding the relative efficacy of the achievement and aptitude tests as predictors of academic performance in various collegiate contexts.

More general questions are evoked by the findings reviewed here and the other evidence cited regarding the predictive validity of a CEEB

Achievement-Test composite which reflects substantial candidate freedom-of-choice in the selection of the tests involved. For example:

> To what extent is candidate "freedom of choice in test selection" a factor which contributes to the predictive effectiveness of the currently available composite?
>
> If an "achievement composite" whose elements are not uniform for all individuals has proved in certain settings to be a better predictor of grades than a "standard" measure of scholastic aptitude, would not a composite based on a common battery of CEEB-type achievement tests be even better?

In rationalizing the advantages of an "achievement average" largely defined in terms of candidate self-selection, it may be hypothesized that given freedom of choice, individuals will elect to be tested in subjects (a) for which they believe they are best prepared and (b) for which they have shown "special" ability and interest (motivation).[4] In these circumstances, keeping in mind that the scales of the respective Achievement Tests are adjusted for differences in the level of verbal ability of students electing them, differences in scores on the CEEB Achievement Average will tend to reflect differences (a) in the average "level of difficulty" of the several subjects in which students feel best prepared and (b) differences in the "level of achievement" at which students are capable of working, under conditions involving some control over interest or motivation. According to this

---

[4]Such a set of assumptions has been offered by Coffman (1971, p. 50) in justification of the idea of averaging scores on "whatever Achievement Tests the student elects to take," for purposes of general academic prediction.

line of reasoning, freedom of choice in test selection may be one of the principal factors contributing to the utility of the current CEEB Achievement Average--which as we have seen includes a substantial SAT-type aptitude component. These factors, of course, would not be operative if all individuals were required to compete on a standard set of CEEB-type achievement tests.

These more general questions are beyond the scope of this paper, but it is believed that they are deserving of further examination.

References

Angoff, William H. Editor. The College Board Admissions Testing Program: A technical report on research and development activities relating to the Scholastic Aptitude Test and Achievement Tests. N. Y.: College Entrance Examination Board, 1971.

Coffman, William E. The achievement tests. In Angoff, pp. 49-78.

Dyer, Henry S. Making test score data effective in the admission and course placement of Harvard freshmen. In Proceedings of the Research Forum, Endicott, N. Y., August 26-30, 1946. New York: IBM Corporation, 1946, pp. 56-62.

McNemar, Quinn. Psychological statistics. New York: John Wiley & Sons, 1949.

Schrader, W. B. The predictive validity of College Board admissions tests, In Angoff, pp. 117-145.

Thorndike, Robert L. Personnel selection. New York: John Wiley & Sons, 1949.

Table 1

Multiple Correlation with Freshman Average Grade of SATs Only, SATs plus Rank, and SA[illegible] plus Rank and Achievement Average, Class of 1970, Several Liberal Arts Colleges

College	N_g	SAT-Verbal plus SAT-Math R	Add Rank to SAT-V & SAT-M		Add Ach Av to Rank & SAT's	
			R	Increase over SAT	R	Increase over SAT And Rank
G	376	.134	.231	(.097)	.283	(.052)
C	309	.190	.329	(.136)	.386	(.057)
F	181	.186	.295	(.109)	.439	(.144)
D	280	.255	.453	(.198)	.525	(.072)
B	398	.267	.364	(.097)	.380	(.016)
H	280	.347	.522	(.175)	.[illegible]77	(.055)
A	460	.358	.467	(.109)	.5[illegible]7	(.130)
J	243	.527	.591	(.064)	.595	(.004)

Table 2

Contribution of SATs to Prediction of Freshman Average Grade when Added to School Rank and the CEEB Achievements

College/ school origin/ Class	N_g	School Rank + CEEB Ach Av R*	School Rank, CEEB Ach Av plus SAT-V & M R*	Increase in R due to adding SAT-V and SAT-M
B-Public '72	246	.306	.368	.062
Private	126	.484	.488	.004
A-Public '72	348	.423	.436	.013
Private	118	.548	.574	.026
D-Public '72	120	.538	.540	.002
Private	121	.596	.597	.001
G-Public '72	254	.472	.485	.013
Private	115	.411	.426	.015
C-Public '72	199	.544	.553	.009
Private	141	.352	.387	.035
F-Public '72	37	.4227	.4231	.0004
Private	158	.446	.462	.016
H-Public '66-67	321**	.644	.649	.005
Private	86	.584	.587	.003
J-Public '66-67	255**	.658	.663	.005
Private	65	.652	.654	.002

*Coefficient of multiple correlation, these variables versus Freshman Average Grade.

**Two classes, combined.

Table 3

Weights Reflecting the Contribution of Basic Entrance Measures to Prediction of Freshman Grades When Measures are Considered Jointly, Classes of '68, '70, and '72, Respectively

College	Standard score regression weights									
	Public					Private				
	SAT-V	SAT-M	Rank	AchAv	(R)	SAT-V	SAT-M	Rank	AchAv	(R)
A# '68	03	02	27	31	(42)	10	-07*	37	28	(51)
A '70	05	00	27	46	(58)	-00*	-06*	33	49	(65)
A '72	13	-01*	23	26	(44)	-20*	-06*	45	41	(57)
B '68	07	-02*	36	33	(55)	09	-02*	18	24	(34)
B '70	18	-06*	30	15	(42)	22	-05*	24	01	(35)
B '72	12	-19**	22	22	(37)	-06*	01	45	27	(49)
C '68	04	09	33	14	(41)	10	-15**	28	18	(36)
C '70	07	-01*	31	15	(37)	13	-13**	18	40	(47)
C '72	11	-07*	47	17	(55)	-09**	-16**	36	29	(39)
D '68	05	-03*	51	18	(58)	08	-25**	37	35	(53)
D '70	-06*	-21*	28	63	(64)	-09*	-00*	32	24	(41)
D '72	02	06	39	20	(54)	-02*	-04*	56	14	(60)
F '68	07	-09*	37	17	(46)	15	00	32	15	(45)
F '70	-06*	-09**	01	48	(45)	-07*	-17*	24	46	(45)
F '72	02	02	35	16	(42)	-08*	15	37	21	(46)
G '68	17	-00*	30	27	(53)	21	-02*	29	09	(37)
G '70	03	04	13	21	(26)	04	-20**	34	23	(40)
G '72	06	-11*	28	36	(48)	12	-06*	26	26	(43)
H '68	05	-03*	48	17	(58)	30	03	09	18	(45)
H '70	01	02	39	30	(56)	-14*	10	36	46	(61)
J '68	02	03	49	22	(67)	04	16	47	07	(64)
J '70	14	13	44	24	(71)	33	11	20	06	(56)

Note: All numerical entries in the table should be preceded by a decimal point. The weights shown in the first four data columns under each school-group are those which are applicable to the respective component variables (designated at head of column) when all have been expressed in comparable, standard score, units. The parenthetical entry is the coefficient of multiple correlation between the four measures (weighted as indicated) and Freshman Average Grade in the respective samples. Simple correlations are shown in Table 4.

#These are standard letter codes for identifying colleges.

*Suppression effect--simple correlation with FAG is positive.

**Reflects <u>negative</u> <u>correlation</u> with Freshman Average Grade.

Table 4

Correlation of Selected Entrance Measures and Combinations thereof with Freshman Average Grade, Classes of '68, '69, '70, and '72, by College and Secondary School Type

College-Class	Public school graduates: Simple correlation V	M	Rk	AA	R	Typical N_g ('70)	Private school graduates: Simple correlation V	M	Rk	AA	R	Typical N_g ('70)
A-68	16	13	27	32	42		20	11*	41	36	51	
A-69	37	23	37	37			12	05	36	38		
A-70	31	28	32	52	58	(352)	31*	16*	47	56	65	(108)
A-72	30	20*	28	35	44		15*	12*	48	37	57	
B-68	20	21*	43	42	55		19	13*	21	26	34	
B-69	29	11	39	37			26	-03	23	29		
B-70	27	05*	31	22	42	(266)	26	03*	27	10	35	(132)
B-72	21	-06	20	24	37		07*	11	42	20	49	
C-68	10	17	35	24	41		12	-10	28	15	36	
C-69	08	21	37	33			06	-04	22	30		
C-70	14	07*	32	21	37	(194)	26	-04	14	39	47	(115)
C-72	24	17*	51	30	55		-04	-05	29	12	39	
D-68	13	05*	54	27	58		13	-04	41	31	53	
D-69	34	16	61	45			15	23	32	40		
D-70	32*	28*	44	58	64	(110)	00*	15*	35	24	41	(170)
D-72	18	24	46	36	54		25*	11*	59	28	60	
F-68	23	13*	42	31	46		26	19	38	30	45	
F-69	Data not available						Data not available					
F-70	25*	-05	21	43	45	(33)	17*	09*	27	36	45	(148)
F-72	28	13	39	24	42		14*	19	37	28	46	
G-68	32	19*	39	41	53		22	06*	27	15	37	
G-69	19	16	43	23			-10	05	16	06		
G-70	12	13	11	22	26	(265)	13	-13	31	08	40	(111)
G-72	24	09*	32	39	48		29	08*	29	29	43	
H-68	25	23*	55	36	58		40	21	09	37	45	
H-69	26	26	39	43			21	16	18	34		
H-70	23	31	46	40	56	(219)	13*	24	41	47	61	(61)
J-68	27	49	61	43	67		39	40	63	51	64	
J-69	20	33	47	46			25	38	62	47		
J-70	48	54	54	56	71	(62)	50	37	39	41	56	(181)

Note: Leading decimals have been omitted for ease of presentation. V, M, Rk, and AA represent SAT-V, SAT-M, Rank, and CEEB Achievement Average, respectively.

* This variable is negatively weighted when combined with the other elements of the prediction battery--i.e., operates, in effect, as a suppressor variable. See standard score regression weights in Table 3.